



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2012-1119; Special Conditions No. 25-470-SC]

Special Conditions: Airbus Model A318, A319, A320, and A321 Series Airplanes; Design Dive Speed

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Airbus Model A318, A319, and A320 series airplanes with modification 160500 and Model A321 series airplanes with modification 160023 (Sharklet). These airplanes will have novel or unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. These design features include a high-speed protection system. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is October 11, 2012. We must receive your comments by **[Insert date 45 days after date of FR publication]**.

ADDRESSES: Send comments identified by docket number FAA-2012-1119 using any of the following methods:

- Federal eRegulations Portal: Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.
- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, D.C., between 8 a.m. and 5 p.m., Monday through Friday, except federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov/>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, D.C., between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.

FOR FURTHER INFORMATION CONTACT: Todd Martin, FAA, Airframe/Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW, Renton, Washington 98057-3356; telephone 425-227-1178; facsimile 425-227-1232.

SUPPLEMENTARY INFORMATION:

The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions are impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive by the closing date for comments. We may change these special conditions based on the comments we receive.

Background

On April 8, 2010, Airbus applied for a change to Type Certificate No. A28NM to include modification 160500 on Airbus Model A318, A319, and A320 series airplanes and modification 160023 on Model A321 series airplanes for the installation of a “Sharklet,” a large wingtip device. The Model A318, A319, A320, and A321 series airplanes are short to medium-range,

twin turbofan, transport category airplanes with a maximum seating capacity of 136 to 220 passengers, a maximum takeoff weight of 130,071 to 205,027 pounds, and a maximum operating altitude of 39,800 feet.

FAA issued special conditions 25-ANM-23, effective December 15, 1988, originally applicable to Airbus Model A320 series airplanes and later to the Model A318, A319, and A321 series airplanes. Those special conditions included revised requirements for dive speed based on incorporation of high-speed protection in the flight control laws. The FAA has determined that new special conditions are needed for the Airbus Model A318, A319, and A320 series airplanes with modification 160500 and Model A321 series airplanes with modification 160023 (Sharklet) and later derivatives because the existing special conditions have evolved over the years and need to be updated for this derivative program.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulation (14 CFR) 21.101, Airbus must show that the Model A318, A319, A320, and A321 series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A28NM or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type certification basis." The regulations incorporated by reference in Type Certificate No. A28NM are 14 CFR part 25, as amended by Amendments 25-1 through 25-56, and special conditions 25-ANM-23. In addition, the certification basis includes certain special conditions, exemptions, or later amended sections of the applicable part that are not relevant to these special conditions.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Model A318, A319, A320, and A321 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, or should any other model already included on the same type certificate be modified to incorporate the same novel or unusual design feature, the special conditions would also apply to the other model.

In addition to the applicable airworthiness regulations and special conditions, the Model A318, A319, A320, and A321 series airplanes must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.101.

Novel or Unusual Design Features

The Airbus Model A318, A319, and A320 series airplanes with modification 160500 and Model A321 series airplanes with modification 160023 (Sharklet) will incorporate the following novel or unusual design feature: A high-speed protection system that limits nose-down pilot authority at speeds above V_C/M_C . This system prevents the airplane from performing the maneuver required under § 25.335(b)(1).

Discussion

Section 25.335(b)(1) is an analytical envelope condition that was originally adopted in part 4b of the Civil Air Regulations in order to provide an acceptable speed margin between design cruise speed and design dive speed. Flutter clearance design speeds and airframe design loads are impacted by the design dive speed. While the initial condition for the upset specified in the rule is 1g level flight, protection is afforded for other inadvertent overspeed conditions as well. Section 25.335(b)(1) is intended as a conservative enveloping condition for potential overspeed conditions, including non-symmetric ones. To establish that potential overspeed conditions are enveloped, the applicant should demonstrate that any reduced speed margin, based on the high-speed protection system in the Model A318, A319, and A320 series airplanes with modification 160500 and Model A321 series airplanes with modification 160023 (Sharklet), will not be exceeded in inadvertent, or gust-induced, upsets resulting in initiation of the dive from non-symmetric attitudes; or that the airplane is protected by the flight control laws from getting into non-symmetric upset conditions. The applicant should conduct a demonstration that includes a comprehensive set of conditions, as described below.

These special conditions are proposed in lieu of § 25.335(b)(1). Section 25.335(b)(2), which also addresses the design dive speed, is applied separately. Advisory Circular (AC) 25.335-1A provides an acceptable means of compliance to § 25.335(b)(2).

Special conditions are necessary to address the high-speed protection system on the Model A318, A319, and A320 series airplanes with modification 160500 and Model A321 series airplanes with modification 160023 (Sharklet). The proposed special conditions identify various

symmetric and non-symmetric maneuvers that will ensure that an appropriate design dive speed, V_D/M_D , is established.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

Applicability

As discussed above, these special conditions are applicable to the Airbus Model A318, A319, A320 series airplanes with modification 160500 and Model A321 series airplanes with modification 160023 (Sharklet). Should Airbus apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on the model series of airplanes listed above. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons

to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Airbus Model A318, A319, and A320 series airplanes with modification 160500 and Model A321 with modification 160023 (Sharklet) series airplanes.

1. Design Dive Speed. In lieu of compliance with § 25.335(b)(1), if the flight control system includes functions that act automatically to initiate recovery before the end of the 20 second period specified in § 25.335(b)(1), V_D/M_D must be determined from the greater of the speeds resulting from conditions (a) and (b) below. The speed increase occurring in these maneuvers may be calculated if reliable or conservative aerodynamic data are used.

(a) From an initial condition of stabilized flight at V_C/M_C , the airplane is upset so as to take up a new flight path 7.5 degrees below the initial path. Control application, up to full authority, is made to try and maintain this new flight path. Twenty seconds after initiating the upset, manual recovery is made at a load factor of 1.5 g (0.5 acceleration increment), or such greater load factor that is automatically applied by the system with the pilot's pitch control

neutral. Power, as specified in § 25.175(b)(1)(iv), is assumed until recovery is initiated, at which time power reduction and the use of pilot controlled drag devices may be used.

(b) From a speed below V_C/M_C , with power to maintain stabilized level flight at this speed, the airplane is upset so as to accelerate through V_C/M_C at a flight path 15 degrees below the initial path (or at the steepest nose-down attitude that the system will permit with full control authority if less than 15 degrees). The pilot's controls may be in the neutral position after reaching V_C/M_C and before recovery is initiated. Recovery may be initiated three seconds after operation of high-speed warning system by application of a load of 1.5g (0.5 acceleration increment), or such greater load factor that is automatically applied by the system with the pilot's pitch control neutral. Power may be reduced simultaneously. All other means of decelerating the airplane, the use of which is authorized up to the highest speed reached in the maneuver, may be used. The interval between successive pilot actions must not be less than one second.

2. The applicant must also demonstrate that the speed margin, established as above, will not be exceeded in inadvertent or gust-induced upsets resulting in initiation of the dive from non-symmetric attitudes, unless the airplane is protected by the flight control laws from getting into non-symmetric upset conditions. The upset maneuvers described in AC 25-7B, Change 1, section 32, paragraphs c(3)(a) and (c) may be used to comply with this requirement.

3. Detected loss of the high-speed protection function must be less than 10^{-3} per flight hour.

4. Failures of the system must be annunciated to the pilots. Flight manual instructions must be provided that reduce the maximum operating speeds. The new operating speeds, V_{max}/M_{max} , must be reduced to a value that maintains a speed margin between these speeds and V_D/M_D that

is consistent with showing compliance with § 25.335(b) without the benefit of the high-speed protection system.

5. Dispatch of the airplane with the high-speed protection system inoperative could be allowed under an approved minimum equipment list that would require flight manual instructions to indicate reduced maximum operating speeds, as described in paragraph (4). In addition, the cockpit display of the reduced operating speeds, as well as the overspeed warning for exceeding those speeds, must be equivalent to that of the normal airplane with the high-speed protection system operative. Also, it must be shown that no additional hazards are introduced with the high-speed protection system inoperative.

Issued in Renton, Washington, on October 11, 2012.

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service

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